

EDU2011 Pilot Program Application
RE: WC Docket No. 10-222
Southwest Licking Local Schools
927-A South Street, Pataskala, Ohio 43062

Southwest Licking Local School District is doing everything right in education—supporting data-informed decision making in the schools, linking data with curriculum mapping, fostering strong parental involvement beginning in early grades. Despite this, our special needs students and low-performing students continue to perform at a level less than their peers. With this thought in mind, we began planning with Project K-Nect and our wireless carrier in March of 2010. However, this request extends K-Nect services (originally implemented in NC school systems) to a population of 311 (9th grade) students enrolled in Southwest Licking Local Schools. Because of the project's success we are planning to enhance the original K-Nect model through development of new curriculum resources and strategies by targeting all of our 9th grade students, rather than just our special education population. The current project (implemented in August 2010) was developed to assure low-performing students could succeed in math and look toward college access and success. Mobile devices have been shown to be effective with this population. Cultivating their interest and success in foundation Math courses (Algebra I) will engage them in learning and prepare them for increased access to college and success therein.

Mobile devices (smartphones) blended with instructional content, assessments, communication and collaboration tools, will yield positive instructional gains for even the most disadvantaged students in Southwest Licking Local Schools. Development efforts undertaken in this project have focused in the areas of; 1) Instant Messaging and Blogs for students with behavioral or social anxiety issues in order to solicit student feedback and encourage collaborative work, 2) Interactivities and Multimedia for attention deficit students making math content more engaging and to demonstrate cause and effect relationships associated with mathematics and, 3) support for individualized learning plans so that student are fully integrated into curriculum maps accommodating ease of collection and reporting performance data. Project K-Nect provides a safe and secure environment to reach a wide range of learners at their own levels of comfort.

Section #1 – Required Information for All Applicants:

A. Background

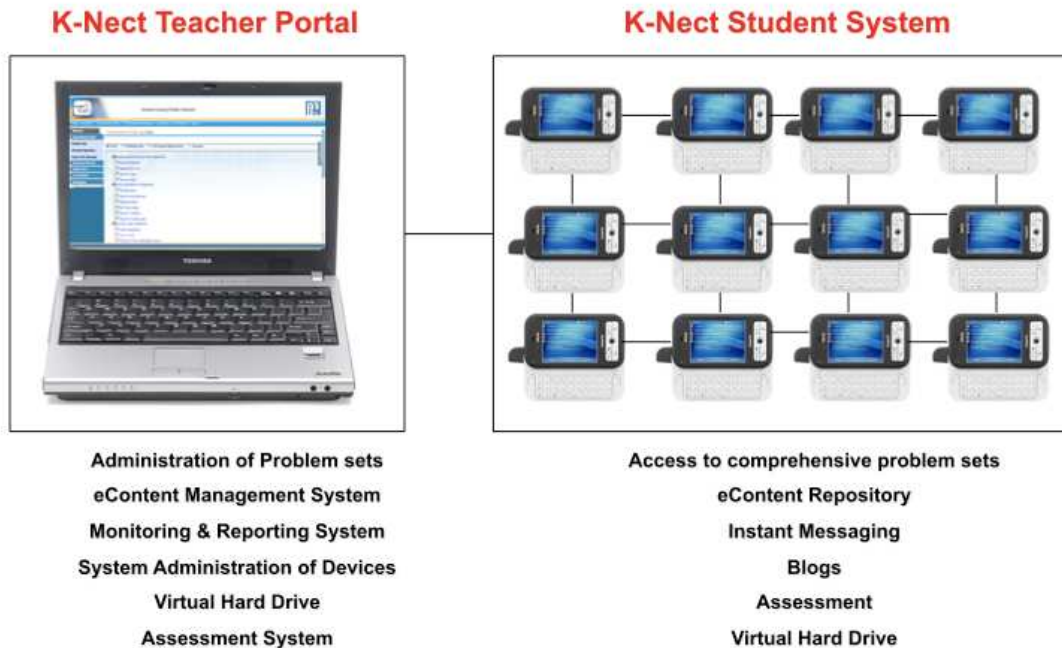
Until the implementation of Project K-Nect, the use of mobile learning devices leveraging 3G (broadband wireless) technologies had never been tested in an authentic K-12 educational setting. Project K-Nect was designed to create resources for secondary at-risk students to focus on increasing their skills related to math and science. In its first phase, Project K-Nect included 100 at-risk 9th grade students from 2 urban and 2 rural schools located in the following North Carolina counties: Onslow, Winston-Salem and Durham for the 2007- 2008 school year. The Project was a direct result of a previous award of \$1M made by Qualcomm to assess the impact of utilizing handheld devices on

student achievement. Participating students received Smartphones with access to supplemental math content aligned to their teacher's current lesson plan objectives. Smartphones were assigned to individual students and teachers. All participants were able to take home the devices. The multi-mode devices enabled the students to gain access to instructional resources regardless of their physical location. Access to the network was obtained via 3G mobile broadband or Wi-Fi. Phase I focused exclusively upon the examination of research outcomes associated with Algebra I. The research demonstrated a clear correlation between utilization of Project K-Nect and increased achievement in Algebra. As a result of this success, Qualcomm agreed to provide a second round of funding to further examine the research outcomes in other subject areas, expand the size of the cohort and add additional pieces functionality for instruction. Qualcomm's generous commitment provided funding for the second semester of the 2008-09 school year and the first semester of the 09-10.

Southwest Licking Local Schools is in its first semester of implementation using Smartphones as an integral part of our 8th grade Algebra IA course. Today, Project K-Nect is entering its seventh semester or third year in Onslow County Schools. The Project has added geometry, algebra 2, pre-calculus, calculus and statistics in order to track the longitudinal effectiveness of the application. In addition to the expansion of curriculum, Onslow County also received a \$2.5M award from the Department of Defense Education Activity (DODEA) in order to expand the project to encompass all 9th grade algebra I students. The DODEA funded portion of the Project is named, Onslow Connect (<http://www.onslowconnect.org>). Through public-private partnerships with Qualcomm and DODEA, Onslow County makes the Project resources available to over 2250 students and over 30 teachers.

B. Project Overview

Project K-Nect encompasses an instructional/administration utility accessible via desktop/laptop web browser and a student system accessible via smartphones and laptops/netbooks/desktops. The instructional/administration module is designed to provide teachers and/or administrators with access to a closed portal site that provides the following functionality.



C. Instructional Center (Teacher/Administrator View):

The instructional center is populated with sequenced primary Algebra I instructional units aligned and correlated to problem sets developed by Math Forum, North Carolina State Standards, problem solving strategies and additional supplemental resources. Teachers are able to assign problem sets to their entire class or individual students. Delivery schedules are made available for the teachers based upon pacing guides and correlated to their individual textbooks. Teachers are able to change the delivery schedule of the problem sets at any time. In addition to the problem sets, teachers are able to add instructional resources to an e-Content Repository. The e-Content Repository includes web links to resources or files viewable on the device (ppt, xls, pdf, doc) that further support the student in achieving the necessary skill set to solve the specified problem. A preview tab is available so that teachers can insure the digital resource can be properly viewed on the device. Finally, the system allows other teachers or authorized users to rate resources that have been added to the repository.

D. System Administration (Teacher/Administrator View):

Through the integration of a 3rd party product from SOTI, teachers or delegated administrators are able to monitor and remotely enable/disable different feature sets on the device such as a camera, instant messaging, and restrict or turn off voice services. In addition, delegated staff at receive automated notifications if a student attempts to breach one of the acceptable use policies (i.e., cheating, cyber bullying, etc.). These features will be further described in the student system section.

E. Reporting (Teacher/Administrator View)

The Project K-Nect system includes a reporting tool that makes available default reports and allow for customized reporting based upon inputs that include:

- Individual navigation path for Problem Set web sessions (site pages, duration, sequence)
- Individual records of text usage during Problem Set sessions (text, start/stop, contact)
- Individual record of phone usage during Problem Set sessions (start/stop, contact)
- Individual performance on embedded assessments (attempts, response, submission time)
- Time spent in each module (Problem set, eContent Repository, Social Networking)
- Number of Blogs Submitted

The student module encompasses a comprehensive set of resources to supplement the primary instructional services. The student module includes three system layers:

F. Problem Sets (Student View):

Problem sets include the following: a multimedia review of the lesson plan unit; video describing the utilization of the problem solving strategy; presentation of the problem; applying the problem solving strategy; multimedia simulations providing the student with an audio/visual view of the problem; at least two assessment based test items; alignment to their local textbook. The problems have content that stems from real-world situations and will be represented using visual effects, e.g. animation, simulation, pictorial, graphical, tabular along with oral and verbal representations. The problems contain content of interest to students in grade 9, age 14-15 years, such as NASCAR racing; music; and sports. In order to view a sample problem set, please visit the following link: <http://www.projectknect.org/theBigRace.html>

G. e-Content Repository (Student View):

In addition to the problem sets, students have access to the e-Content repository under which digital resources are made available that have been submitted by K-Nect instructors or staff from Math Forum. Each resource is aligned by the state textbook unit, problem set and state standard. The system allows students to rate and comment on resources. Furthermore, prior to viewing a resource, students are able to see a complete list of resources available and aligned to the unit with average ratings.

H. Social Networking

Students have access to peer-to-peer collaboration tools that will include blogging and instant messaging. Individual communities are formed for each problem that is assigned. All content submissions to the site are stored within the community established for the specific problem. This feature allows users to go back into the system to utilize previously submitted content to assist them in maintaining mastery of the lesson plan unit and allow future students to build upon content already created. The students have access to an authoring/editing tool to allow them to post content via their mobile device. Students are able to post the following types of content in the blogs: video, text, and pictures, ppt, doc, pdf. For instant messaging, students are able to determine what other students are online utilizing the following classifications:

- Students seeking help from other students
- By Classroom

- By School

Students have the option of logging into the system as an anonymous user, but the system administrator will always be able trace the identity of the end user. Instant messaging features will allow up to 10 students to participate in a chat.

II. Poverty Level:

The current poverty levels (and accompanying E-Rate discount levels), as measures by eligibility for the free or reduced priced lunch program for the both the schools and district are as follows:

- Watkins Middle School- 34.85% eligible for NSLP (60% Discount)
- Watkins Memorial High School- 30.232% eligible for NSLP (50% Discount)
- Southwest Licking Local Schools- 32.82% eligible for NSLP (54% Discount)

The district was able to acquire the ML devices and currently serves 190 8th grade students enrolled in Algebra 1A (hereafter Algebra I – Southwest Licking Local School District, because of low performance in the comprehensive Algebra I course offering, has redesigned the Algebra I program to be reflected as two, one year, Algebra 1A and 1B courses). 190 Algebra IA students have been provided with devices (integrated mobile broadband chips) and access to instructional content, SWL is unable to cover the costs associated with 100% off campus mobile broadband for all 8th grade students. As a result, SWL is only able to provide for connectivity to approximately 190 students. Through this application, Southwest Licking Local Schools is seeking to provide 100% of its 9th grade Algebra I students with access to off campus mobile broadband connectivity.

III. Financial Need:

Approximately 10% of our student population does not have Internet access available at home. Our largest barrier to the project was the need to purchase and install hotspots in the middle school so our student could have faster connectivity. Additionally our wireless carrier is working on helping us install in-building repeaters at both our middle school and high school locations, due to the fact that our 3G signal is weak in all of our buildings. The funding from this grant would enable us to expand the project to the high school and continue working with our current cohort while expanding the project to all of our 9th grade students. Due to the financial deficit our district has been facing we lack of access to technology. One computer lab in each building does not give our students enough access to the technology they need to enhance their learning.

IV. All Costs Including E-Rate Eligible Support:

The Budget includes Services, Hardware, Software and Administration costs. These are described in detail below.

Project Management (\$50k) – The PM Office will be responsible for the coordination of the various elements (technical, instructional, technology, applications, content, tools,

and personnel) of the project. The PM Office will provide support in the initial planning and implementation phase of the project, its execution and production phase, along with overall monitoring and controlling systems. In addition, the PM Office will be responsible for ongoing administration and reporting of progress made as a result of the Grant award, and will be responsible for horizontal reporting to all participants, in addition to ‘vertical’ reporting to the Office of Innovation and Improvement. The PM function is an essential part of the coordination of this project as it provides the glue to bind and coordinate all parties to ensure successful outcomes while ensuring the appropriate reporting and tracking framework exists to provide appropriate oversight to the Office of Innovation and Improvement Grant Administrator.

Implementation (\$16k) – For each student participating in the project a user account will need to be created and maintained. In addition to the user accounts, implementation services also provide for the creation of teacher/student class rosters, imaging (loading the software and content) of each student device, and mobile device broadband provisioning.

Training (\$15k) – For each participating student, teacher, and site based instructional technology coordinator, training will be provided the various elements of the system. This training will be provided both onsite as group sessions, and can also be arranged as online sessions to accommodate scheduling challenges.

Support (\$150k) – The support category includes Tier 1 technical support for the project (both as a ‘help desk’ and onsite). Technical Support is provided for the devices used by students and teachers, the applications and content used on the devices, along with providing instructional (pedagogic) support for the teachers using the system. The goal of the “Support” program is to ensure that technical hurdles do not hinder project success and to ensure that participating teachers have a ‘go to’ point for questions about instructional approaches. The Support category also includes the provision of an “Instructional Technology Coordinator” for the participating school site for the duration of the three year project.

Monitoring and Evaluation (\$100k) – The Monitoring and Evaluation office will conduct an independent evaluation of this project and “will cooperate with any technical assistance provided by the Department or its contractor”. The Monitoring and Evaluation office will also make “broadly available through formal (e.g., peer-reviewed journals) or informal (e.g., newsletters) mechanisms, and in print or electronically, the results of any evaluations it conducts of its funded activities.” Further, the data from the Monitoring and Evaluation office evaluations will be made available to third-party researchers consistent with applicable privacy requirements. The Monitoring and Evaluation office will also, consistent with guidance as provided by the Office of Innovation establish both short term and long term performance measures for this project.

Hosting (\$5k) – Provides for the hosting (storage and backup) of files, content, and other resources and application software either used by, or created by, students and teachers participating in the project. This also provides for the back-up of data and application

files and ensures high reliability of the applications and tools use to deliver services to participants.

Carrier Fees (\$60k) – Provides mobile data services to student and teacher devices.

Mobile Devices & Computers (\$1.6k) –Mobile Devices (or netbooks) will be procured for participating students and teachers.

Licensing Fees (\$10k) – Represents the costs for software applications (SOTI, Sharepoint, SQL Server) used to implement and support the project.

Travel (\$3.5k) – Represents travel and expenses for Monitoring and Evaluation team along with travel costs associated with technical, implementation, and support personnel.

Office Supplies (\$2k) – Covers costs of reproduction of training manuals, end user manuals, reports, and other materials as needed for distribution/publication.

Year 1 – 2010/11 School Year Budget Summary

Services		
Project Management		\$50,000
Implementation		\$16,000
Development		\$0
Training		\$15,000
Support		\$150,000
Monitoring and Evaluation		\$100,000
Hosting Fees		\$5,000
Carrier Fees		\$60,000
	TOTAL YTD ANNUAL	\$396,000
Hardware		
Mobile Devices		\$19,500
Computers		\$0
		\$0
	TOTAL YTD ANNUAL	\$19,500
Software		
Licensing Fees		\$10,000
	TOTAL YTD ANNUAL	\$10,000
Administrative		
Travel		\$3,500
Office Supplies		\$2,000
	TOTAL YTD ANNUAL	\$5,500
TOTAL		\$431,500

V. Resources Available to Implement the Entire Applicants Program:

Other sources of funding include, but are not limited to: Local Funds, Title I ARRA Funding and Title I Funding.

VI. Support for off-premise connectivity:

Off campus access enables learners to access instructional resources regardless of their physical location or economic status. Southwest Licking has built over the course of this initiative a focus on the integration of project-based learning. Project based learning encompasses a heavy dependency on communication and collaboration with students, teachers and administrators. Strong efficacy with increased student achievement and utilization of project-based learning has been shown with off campus access. It is anticipated that with increased access to instructional resources, students will increase their math proficiency levels.

VII. Cost-effectiveness Analysis:

Southwest Licking has examined the implementation model associated with its initiative. Through the analysis, we have found the following benefits associated with a traditional one to one implementation with Wi-Fi versus a mobile learning device with off campus mobile broadband services:

- **Device and location independence** enables users to access systems regardless of their location or what device they are using, e.g., PC, mobile.
- **Reliability is enhanced** by way of multiple redundant access points (Wi-Fi and 3G), which makes it suitable for continuity and disaster recovery.
- **Client Hardware is generally cheaper** because the District is able to fully integrate a mobile cloud implementation as students will have access to network resources regardless of their physical location. The District will not be required to acquire devices that contain large moving disk drives and minimizes requirements to have access to powerful application memory and processors. The devices also will have a longer period before requiring an upgrade or becoming obsolete. There are fewer moving parts and one upgrades the server and network instead because the limitation on performance is the display resolution which has a very long life cycle.
- **Simple software upgrade path.** If the peak resource usage is above a pre-defined limit, it is a relatively simple process to add another component to a server rack (be it power, processing, storage), boosting resources to exactly the amount required. The existing client devices can continue to serve alongside the new.
- **Capital expenditures are minimized associated with network infrastructure costs** as the 3G infrastructure is owned by the carrier and does not need to be purchased or managed directly by the school system.

In addition to the above, Southwest Licking has estimated the total cost of ownership associated with a traditional one to one implementation is approximately \$1,500 per student. This number encompasses the following:

- Smartphone Device

- LMS (Learning Management System)
- Network Capital Expenditures
- Network Management
- Instructional Content
- Professional Development
- Instructional Technology Support

This model does not include costs associated with 3G or off campus mobile broadband services. Southwest Licking estimates future costs associated with its implementation model that is built around a cloud services model to total no more than \$500-\$700 per student. The latest reports concerning the total cost of ownership associated with a traditional one to one implementation are estimated to be \$1500 per student. This represents a cost savings of approximately \$800-\$1000 per student.

Section #2 – Required Information for Schools Only:

1. Location of the Schools:

Watkins Middle School
8808 Watkins Road SW, Pataskala, Ohio 43062

Watkins Memorial High School
8868 Watkins Road SW, Pataskala, Ohio 43062

2. Name of the school applicant, along with a complete list of the individual schools that will be served, including their billed entity numbers:

Southwest Licking Local Schools, Watkins Memorial High School

3. Description of the school or district:

The District is organized under Article VI, Sections 2 and 3 of the Constitution of the State of Ohio. The District operates under a locally-elected Board form of government consisting of five members elected at-large for staggered four year terms. The District provides educational services as authorized by State statute and federal guidelines. The five member Board of Education serves as the taxing authority, contracting body, and policy maker of the District. The Board of Education adopts the annual operating budget and approves all expenditures of the District.

The District was established in 1953 through the consolidation of existing land areas and the Etna, Kirkersville and Pataskala school districts. The District serves an area of approximately 65 square miles. The District is located approximately eighteen miles east of Columbus, the state capital, in Licking County, and includes the City of Pataskala, the Village of Kirkersville and portions of Etna, Harrison, St. Albans, and Union Townships in Licking County and Liberty Township in Fairfield County. The District operates one high school (grades 9-12), one middle school (grades 6-8), three elementaries (grades 1-5), one

kindergarten center (grade K), one administrative building, and one support service building.

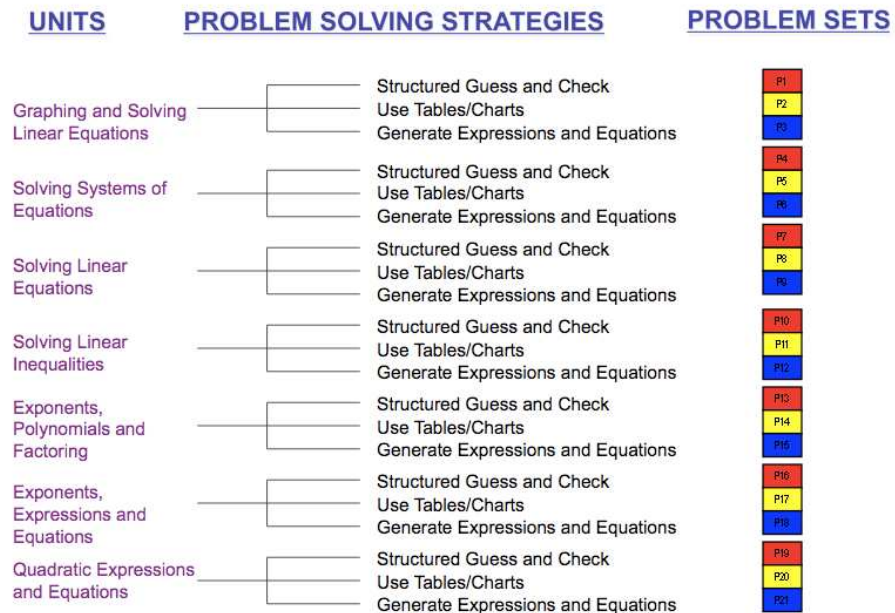
The District provides a full range of traditional and non-traditional educational programs and services. These include regular and vocational instruction, special education instructional programs for handicapped and gifted students; and a broad range of co-curricular and extracurricular activities. In addition, the school district sponsors a community on-line school for students whom their parents have chosen to home-school or various other reasons.

4. Description of the Program's curriculum objectives, the grade levels included, and the number of students and teachers involved and/or being served as part of the program; and a summary of any data collected by the school on Program outcomes and achievement of Program objectives:

Project K-Nect's curriculum is based on Drexel University's Math Forum. This curriculum is research-based with emphasis on problem solving and scaffolding. The repository of 18 math problems is aligned with state standards and can be easily downloaded by teachers into students' devices. The focus is to engage the students in the application of problem-solving strategies as tools for thinking about and solving problems. The problems will address key concepts that are aligned with the Ohio's Algebra 1 Course of Study. The curricular foundation is animated problem-based learning, which has the capability to be relevant to youth today and reflect multiculturalism.

Problem-based learning: A particular emphasis of the design of the Problem of the Week (PoW) environment is rich problem-solving contexts which allow learners to draw on their range of math knowledge skills in problem solving. This places the emphasis on thinking about the context of the problem rather than simply drawing on an algorithm for problem solution. The design also involves explaining the solution strategy, a practice that leads the learner to reflect on choices and to revise.

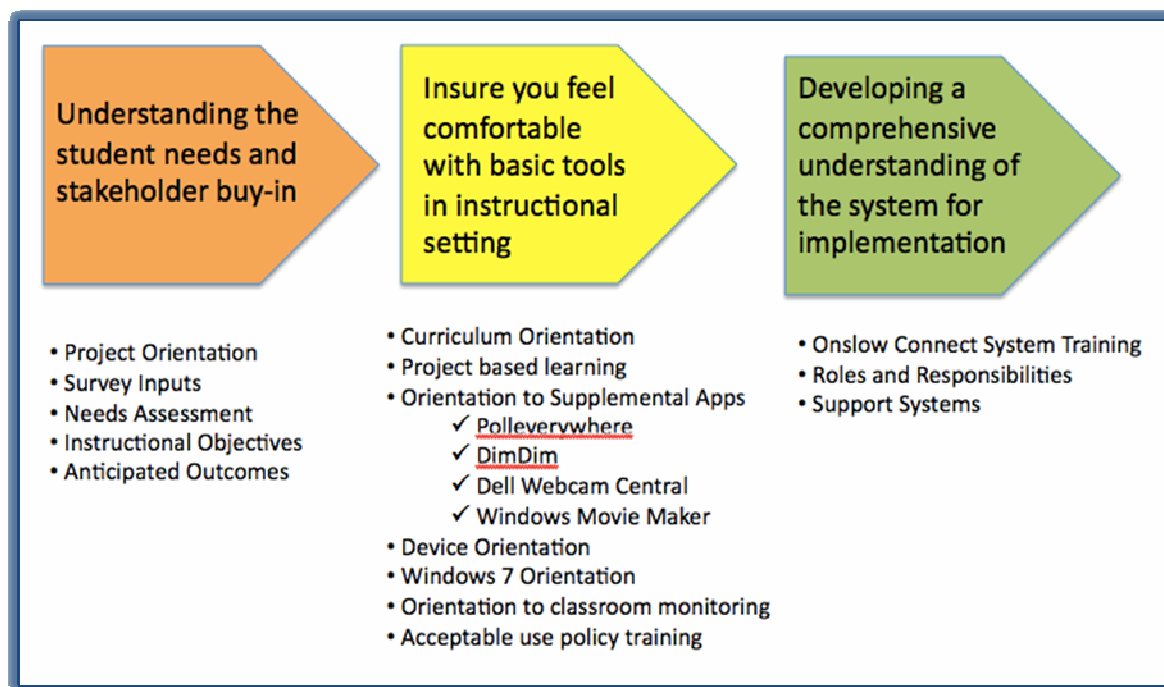
The students will solve one to three challenging, non-routine mathematic problems. The problems have content that stems from real-world situations and will be represented using visual effects, e.g. animation, simulation, pictorial, graphical, tabular, along with oral and verbal representations. Problems contain content of interest to students in grades 8, 9, and 10, such as NASCAR racing, music, and sports.



Planning and development began in March of 2010 and implementation began in August of 2010. Professional development has been provided to all current 8th grade Algebra IA teachers, high school based instructional technology coordinators and middle school administrators. The following is a summary of the combined Project K-Nect and Southwest Licking Local School's training rollout.

School Year	#of Staff	Middle School/High School	Hours	# of Students
2009-10	3	Watkins Middle School	16	190
2010-11	6	Watkins Memorial High School	16	311

The foundation of the professional development program was built upon the following iterative stages:



All staff development resources based upon the above foundation are available at the following url:

http://www.onslowconnect.org/Professional_Development.html

5. Current Research/Outcomes:

PsyMes Consulting conducted independent research on the viability and efficacy of phase one of Project K-Nect on student achievement in mathematics. Researchers from PsyMes Consulting monitored and collected quantitative and qualitative data from January 7, 2008 through June 5, 2008. The following is a summary of some of the major research outcomes associated with phase one:

- Four out of the four cohort Project K-Nect Algebra I classes outperformed the other Algebra classes taught by the same teachers on the NC End of Course Exam (EOC) for Algebra I.
- All four cohort Project K-Nect classes outperformed the other Algebra classes taught by the same teachers with their final grades.
- The aggregate gain of all four cohorts between the pre-test and post-test administered by the research team was 20%.
- Students report using the phone for at least one hour to complete their Algebra work.
- Students reported increased parental support for their instruction in Algebra.
- Students reported increased communication and collaboration with their teachers.
- Students reported increased communication and collaboration with their peers on questions with homework assignments.

- Students reported a better understanding of mathematics because of real world applications associated with the curriculum.
- Students indicated that because they had continuous access to mathematical resources on the mobile device, their instructional time dedicated to Algebra significantly increased.

The following is a summary of the current research data regarding phase II of Project K-Nect which was implemented during the 2009-10 school year. Project K-Nect classes are denoted with an asterisk symbol.

Algebra I – EOC Results

Southwest High School – Onslow County

Class	Teacher	EOC Proficiency Levels	Period of Evaluation
Algebra I	S. Kliewer*	91%	Spring 2009
Algebra I	Teacher A	76%	Spring 2009
Algebra I	Teacher B	60%	Spring 2009

Dixon High School – Onslow County

Class	Teacher	EOC Proficiency Levels	Period of Evaluation
Algebra I	H. Spring*	93%	Spring 2009
Algebra I	Teacher A	79%	Spring 2009
Algebra I	Algebra B	71%	Spring 2009
Algebra	Teacher C	67%	Spring 2009

Southern School of Engineering – Durham

Class	Teacher	EOC Proficiency Levels	Period of Evaluation
Algebra I	E. Moffitt*	71%	Spring 2009
Algebra I	Teacher A	48%	Spring 2009
Algebra I	Teacher A	0%	Spring 2009

Walkertown Middle School – Winston-Salem

Class	Teacher	EOC Proficiency Levels	Period of Evaluation
Algebra I	C.Webster*	96%	2008-09 School Year

Geometry – EOC Results

Southwest High School – Onslow County

Class	Teacher	EOC Proficiency Levels	Period of Evaluation
Geometry	S. Klierwer*	90%	Fall 2008
Geometry	Teacher A	74%	Fall 2008

Dixon High School – Onslow County

Class	Teacher	EOC Proficiency Levels	Period of Evaluation
Geometry	H.Spring*	65%	Fall 2008
Geometry	Teacher A	40%	Fall 2008
Geometry (H)**	Teacher B	70%	Fall 2008

**H= Honors

Algebra II – EOC Results

Southwest High School – Onslow County

Class	Teacher	EOC Proficiency Levels	Period of Evaluation
Algebra II	E. Klierwer*	83%	Spring 2009
Algebra II	Teacher A	71%	Spring 2009
Algebra II	Teacher A	33%	Spring 2009

Dixon High School – Onslow County

Class	Teacher	EOC Proficiency Levels	Period of Evaluation
Algebra II	H.Spring*	81%	Spring 2009
Algebra II (H)**	Teacher A	75%	Spring 2009
Algebra II	Teacher B	50%	Spring 2009
Algebra II	Teacher C	30%	Spring 2009

**H= Honors

As a continuation of the PsyMes report, Project Tomorrow independently assess efficacy on student achievement for the 2009-10 school year. Highlights of the report include:

- Students participating in Project K-Nect have a greater self-perception (61%) that

they are succeeding academically than their national peers (39%). And they believe that they are being better prepared for that success (55%) than other students (45%).

- Project K-Nect has provided a “safety net” of additional support for the students through the connections with classmates and teachers, and new approaches to learning math. As a result of participation in the program this year, over 90% of the students said that they are now more comfortable learning math, and 81% said that they have increased confidence talking about math and math problems.
- Almost two-thirds of the students reported taking additional math courses and over 50% are now thinking about a career in a math field as a result of participation in Project K-Nect.
- The teachers involved in Project K-Nect also report that their students are more responsible for their own learning and have developed more collaborative learning skills as a result. Additionally, the teachers note that their students are more active participants in the class, as either learners themselves or, in many cases, as teachers or peer coaches to their classmates. This was especially significant for students who are normally shy or reluctant class participants due to disabilities or limited English proficiency and can now participate more fully through the IM or blogging features.
- Project K-Nect participating students continue to pursue rigorous Mathematics instruction with 90% of the initial student cohort currently enrolled in AP Statistics, a college level statistics course taken by less than 1% of high school students nationwide. Project Tomorrow plans to track these students as they enter post-secondary schooling.
- We’re extremely optimistic about the findings and what they mean for the future of smartphones in the classroom,” says Julie Evans, Project Tomorrow Chief Executive Officer, whose organization prepared the evaluation report. “Students improved their scores in Math by an average of 20 percent, and this technology and wireless Internet access ensured the equitable delivery of engaging instruction, bridging the persistent digital and achievement divides. Project K-Nect and this report have significant new implications on how, when and where we engage students in a learning process.”

For access to the full comprehensive report, please visit the following url:

<http://www.tomorrow.org/research/ProjectKnect.html>